

# PATENT SPECIFICATION

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## NO DRAWINGS

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## (54) BEVERAGE COMPOSITION

(71) We, NESTLE'S PRODUCTS LIMITED, Nestlé House, Collins Avenue, Nassau, Bahama Islands, a company incorporated in the Bahama Islands, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The present invention is concerned with the production of powdered beverage compositions which can be reconstituted in cold water to provide refreshing beverages of which the flavour and appearance resemble fresh juices.

15 There exist different products which, on dispersion in water, resemble in colour and flavour the juices of fresh fruits such as orange, grapefruit, and pineapple. On reconstitution, these products provide beverages which however do not have the appearance, and especially the cloudiness and pulpy nature, of natural fruit juices.

20 In general, the substances of which these products are composed are water-soluble so that, after reconstitution with water, a relatively clear beverage is obtained which does not resemble a fruit juice, but is more in the nature of a soft drink. Attempts have been made to reproduce the natural cloudiness of fruit juices, in particular by addition to the composition of insoluble substances. After 25 reconstitution with water, these products nevertheless tend to give unstable suspensions which either form an unattractive scum on the surface of the beverage or a sediment at the bottom of the container.

30 Also known are powdered compositions for preparing artificial fruit juices, such compositions containing an additive adapted to give the reconstituted beverage the opacity or turbidity found in natural fruit juices. This additive, hereafter designated "clouding agent", may for example be composed of a dry emulsion produced from a fat and an encapsulating hydrophilic colloidal material such 35 as a water-soluble edible gum. In order to

secure good dispersion of the fat particles in the reconstituted product, the clouding agent is spray-dried as a fine powder, which is then mixed with other solid constituents. After 40 packaging of the product, the distribution of the clouding agent within the body of the beverage composition may vary after transport and handling with the result that reconstituted beverages are sometimes obtained of which the composition is not strictly the same for successive portions of product removed from the same package.

45 The present invention is concerned with a composition for preparing beverages resembling natural fruit juices, and also with a simplified process for producing the composition.

50 In one embodiment of the beverage composition according to the invention is characterised in that it consists of agglomerates of free-flowing granular particles comprising sugar, an edible acid and a flavouring, the particles being agglomerated together with a binder consisting essentially of an edible fat and an edible gum. This composition is advantageously prepared by a process which comprises preparing a binder comprising an emulsion of an edible fat in an aqueous solution or dispersion of an edible gum, agglomerating the sugar and at least a major portion of the other solid constituents with the resulting emulsion, and drying the agglomerated product.

55 Preferably, an aqueous solution or dispersion is prepared containing 1 to 3 parts by weight of gum arabic and 1.5 to 6 parts by weight of water, one part by weight of hydrogenated edible fat is then added and the resulting emulsion is homogenised at least once.

60 The composition according to the invention is generally adapted for the preparation of imitation fruit juices, and especially juices resembling natural juices which are relatively cloudy in appearances, such as those obtained from the following fruits:

	citrus fruits	:	orange tangerine grapefruit
5	—tropical fruits	:	<i>Annona muricata</i> Linné guava ( <i>Psidium guayaba</i> ) mango ( <i>Mangifera indica</i> ) papaya ( <i>Carica papaya</i> ) passion fruit ( <i>Passiflora edulis</i> Sims)
10	—drupes	:	apricot cherry peach plum
15	—berries	:	blackcurrant raspberry redcurrant
	—other fruits such as pear, grape, and pineapple.		

The constitution of the composition may vary to a certain extent depending on the nature of the fruit, so that the flavour, colour and texture of the reconstituted beverage resemble those of the natural juice. However, most of the ingredients are common to all compositions. This is the case for sugar, comestible acid and the clouding agent. On the other hand the type and quantity of flavouring, colouring matter, pectin, mineral salts, and vitamins, are selected so that the composition of the artificial beverage corresponds as far as possible to that of the natural juice.

According to the invention, the clouding agent is preferably prepared by emulsifying an edible fat in an aqueous solution or dispersion of an edible gum. This may be carried out by directly mixing, with vigorous stirring, the three constituents of the emulsion, that is the fat, the gum and water.

However, in a preferred embodiment of the process, the clouding agent is prepared by dispersing, at a temperature between 50 and 70°C and with stirring, one part by weight of edible fat in a solution containing 1 to 3 parts by weight of edible gum in 1.5 to 6 parts by weight of water. The concentration by weight of the solid matter present in the emulsion should be between 40 and 60%. Preferably, the edible fat is a vegetable fat; good results have been obtained with a hydrogenated peanut oil having the following properties:

Iodine value	:	50—70
Saponification value	:	180—190
Softening point	:	26—28°C
Melting point	:	28—30°C

55 The edible gum, used as encapsulating agent, is preferably a water-soluble gum, especially gum arabic. It may also be advan-

tageous to add a small quantity of an antioxidant to the emulsion, for example a mixture of tocopherols.

The emulsion is preferably homogenised before use, as it has been observed that the turbidity of the reconstituted beverage depends to a large extent on the conditions of homogenisation, in particular the pressure. Desirably, the emulsion is subjected to two successive homogenisations, each at a pressure of about 200 kg/cm<sup>2</sup>.

Separately from the emulsion, a dry blend is prepared, using appropriate apparatus, of the solid constituents of the composition, that is sugar acid and optional solid additives such as colouring, flavouring, mineral salts and vitamins. Liquid flavouring and colouring materials may also be used, and these are preferably added to the emulsion prior to agglomeration.

In order to obtain a reconstituted beverage having the pulpy nature of a natural fruit juice, pectin and stabilising agent such as sodium carageenate are desirably also incorporated in the composition. After careful mixing of the various constituents, the product is preferably ground to an average particle size between 0.15 and 0.20 mm, with about 80% of the product passing through a 210 micron mesh screen (No. 70 U.S. Standard Mesh).

The products are then agglomerated to provide free-flowing granules. The emulsion used as binder is preferably dispersed on the dry blend of solid substances at a rate of 4 to 10 parts by weight of emulsion for every 100 parts by weight of said blend. The quantity of emulsion is inversely proportional to its fat content so that for an emulsion containing 50 to 60% by weight of solids and having a fat/gum ratio close to 1:1, 5 to 6 parts by weight of emulsion are sufficient for 100 parts by weight of the dry blend.

Preferably the emulsion is at a temperature of 50 to 60°C during agglomeration.

- It is preferred to use a rotating disc apparatus for agglomeration. This apparatus essentially comprises a rotatable metal dish, which may be inclined with respect to the horizontal and has a peripheral rim. The dry blend is continuously deposited on the surface of the dish and the particles, on which the binder is dispersed, agglomerate together whilst moving through a certain angular distance over the surface of the dish before falling back towards the lower rim. As the operation proceeds, the agglomerates rise to the surface and overflow the rim, falling from the dish when they have reached the desired size. The dish may for example be inclined at about 28° to the horizontal, and be rotated at about 27 r.p.m. The emulsion is dispersed on the dry blend through a suitable nozzle and the resulting agglomerates or granules preferably have an average particle size between 0.7 and 1 mm.

The agglomerates which are collected contain a certain amount of water which is eliminated by after-drying. Preferably, the product is dried as a fluidised bed in air heated at a temperature of about 70°C. The dried material may be screened prior to packaging.

Alternatively, agglomeration may be carried out in known manner in an agglomeration chamber or tower. Here, the emulsion is sprayed on a jet of powder at the top of the chamber where a temperature between 60 and 140° is maintained and dried agglomerates or granules are collected at the base.

The flavouring used in the composition may be added at different stages of the process. If, for example, it is added to the dry agglomerated product, the volatile substances present are not exposed to the different heat treatments involved in the process and consequently evaporation losses and possible degradation of these substances is avoided. Preferably, the aroma is added to the agglomerated product in the form of a dry powder. Optionally, the aroma may be applied as a solution which is sprayed onto the agglomerates.

Alternatively, the flavouring may be added to the dry blend as a powder before agglomeration, so that the particles are distributed homogeneously throughout the mass of product by incorporation in the agglomerates. The flavouring, in liquid or solid form, may be incorporated in the emulsion of clouding agent used as binder, and homogeneous distribution of the aromatic substances throughout the dry product is thus also obtained.

The following Example, in which all parts are by weight, is given only for the purpose of illustration.

#### EXAMPLE

28.5 parts of powdered gum arabic are dispersed in 45 parts of water. The mixture is heated to 50°C and stirred for about 5 minutes. 25 parts of hydrogenated peanut oil having the following characteristics are then added:

Iodine value	: 50—70	65
Saponification value	: 180—190	
Softening point	: 26—28°C	70
Melting point	: 28—30°C	75

together with 1.5 parts of a mixture of tocopherols. The mixture is emulsified at high speed for 30 seconds at a temperature of about 50°C and the resulting emulsion is then homogenised, in a conventional apparatus, in two passes each at a pressure of 200 kg/cm².

Separately, the following composition is prepared:

90.75 parts of sugar		85
7.26 " of powdered citric acid		
0.69 " of pectin		
0.47 " of ascorbic acid		
0.39 " of tricalcium phosphate		
0.39 " of sodium carageenate		
0.04 " of yellow colouring		90
0.01 " of orange colouring		

These substances are dry blended in a suitable mixer and the product is then ground to an average particle size of 0.15 to 0.2 mm, 80% of the blend passing through a screen of 210 microns mesh (No. 70 U.S. Standard Mesh).

The dry blend thus obtained is agglomerated on a disc granulator of the Polysius (Registered Trade Mark) type, the emulsion prepared as described above being used as binder which is sprayed on the product through a pneumatic nozzle at a rate of 5.7 parts per 100 parts of dry blend. The disc is inclined at 28° to the horizontal and is rotated at 27 r.p.m. The agglomerates are after-dried as a fluidised bed in air at about 70°C, and screened. A dry composition having a density between 630 and 700 g per litre and a moisture content of 0.5% by weight is obtained.

The product is aromatised by addition of a concentrated orange flavouring (Tetrarome Orange 100%, Firmenich, Geneva) at a rate of 0.36 g per 100 g of dry granules.

In one modification, the flavouring is added to the dry blend before grinding, at a rate of 0.54 g per 100 g of blend.

Alternatively, the flavouring in liquid form is added to the emulsion of clouding agent. In this case the emulsion has the following composition:

5	Gum arabic : 28.2 parts
	Hydrogenated vegetable fat : 24.2 "
	Water : 44.5 "
	Tetrarome Orange 100% : 1.6 "
	Mixture of tocopherols : 1.5 "

10 A beverage having the appearance, texture and flavour of natural orange juice may be prepared by dispersing 150 g of dry granules in 1 litre of water at 5—15°C and stirring for about 1 minute.

WHAT WE CLAIM IS:—

- 15 1. A process for preparing a flavoured beverage composition which comprises agglomerating a dry particulate blend comprising sugar and an edible acid with a binder comprising an aqueous emulsion of an edible fat and an edible gum, a flavouring being added to at least one of the dry blend, aqueous emulsion, or agglomerated product.
- 20 2. A process according to claim 1, in which the emulsion contains 1 to 3 parts by weight of edible gum, 1 part by weight of edible fat and 1.5 to 6 parts by weight of water.
- 25 3. A process according to claim 1 or claim 2, in which the emulsion contains 40 to 60% by weight of solid matter.
- 30 4. A process according to any one of the preceding claims, in which the emulsion is homogenised.
- 35 5. A process according to claim 4, in which the emulsion is homogenised at a pressure of about 200 kg/cm<sup>2</sup>.
6. A process according to any one of the preceding claims, in which the fat is hydrogenated peanut oil having a melting point of 28 to 30°C.
7. A process according to any one of the

preceding claims, in which the agglomeration is effected in a rotating disc granulator.

8. A process according to claim 7, in which the emulsion is at a temperature of 50 to 60°C during agglomeration.

9. A process according to any one of the preceding claims, in which 4 to 10 parts by weight of emulsion are used to agglomerate 100 parts by weight of dry blend.

10. A process according to any one of the preceding claims, in which the edible gum is gum arabic.

11. A process according to any one of the preceding claims, in which the emulsion contains a flavouring.

12. A process for preparing a beverage composition essentially as herein described with reference to the Example.

13. A beverage composition prepared by a process according to any one of the preceding claims.

14. A beverage composition in the form of free-flowing agglomerates of granular particles, the agglomerates comprising sugar, an edible acid and a flavouring, the particles being agglomerated together with a binder consisting essentially of an edible fat and an edible gum.

15. A composition according to claim 14, in which the average particle size of the agglomerates is between 0.7 and 1 mm.

16. A beverage composition substantially as herein described with reference to the Example.

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